Capgemini engineering

CAPGEMINI ENGINEERING E-MOBILITY EXPERTISE CENTER

Providing Unrivalled Expertise and Safety Compliant Electrification Design of Passenger Cars and Commercial & Special Vehicles

Transformed mobility industries

Electric vehicles (EVs) are nearing a turning point as changing consumer attitudes, improved battery economics, broader access to charging infrastructure, and stricter regulatory policies all present growth opportunities. However, the transition to electric propulsion sets to transform mobility industries and the transport sector globally.

Electrification and alternative drives are driven by regulation and local emission optimization;
Original Equipment Manufacturers (OEMs) are facing heavy investment demands with new vehicle architectures required.

Safety regulation becomes a major driver, as the introduction of Autonomous and Advanced Driving Assistance Systems (ADAS) will generate new challenges.

New logistics process will be to consider with the further growth of large fleets expected, new players and business models (with digital ecosystem), and a stronger specialization.

New digital technologies and culture will create new use cases, e.g., in the context of advanced truck and trailer telematics.

Reducing CO2 emissions from heavy-duty vehicles

From 2025, manufacturers will have to meet the targets set for the fleet-wide average CO2 emissions of their new large vehicles. The forecasts are ambitious, with CO2 emission reduction of 15% in 2025. Source: European Commission.

Regarding the trucks market, an ambition of safer and greener traffic is pushed by passenger vehicles, with less polluting vehicles and more advanced technological solutions: by mid-century, greenhouse gas emissions from transport will need to be at least 60% lower than in 90s and be firmly on the path towards zero.
Source: European Commission.

To support these efforts, the European Commission proposed to make it easier for manufacturers to design more aerodynamic vehicles using less fuel and emit less CO2.

On the other side, special vehicles market, especially agricultural and construction equipment, are a key source of pollution in many countries and regions: In the US, they account for almost 3/4 of the fine particulate matter (PM2.5) and ¼ of the nitrogen oxides (NOx) emitted. In Europe, it contributes to approximately ¼ of the PM2.5 and it is more than 15% of the NOx emitted, mostly explained by the emission-control strategy for non-road vehicles, which is late compared to heavy-duty vehicles.

Unique Capgemini Engineering E-Mobility expertise center

Experience

Based in Helmond, Netherlands, at the Automotive Campus, hosting various high-quality technical facilities, Capgemini Engineering is a key player with a unique automotive e-mobility expertise center. With 20 years of experience, 30 electrification design projects managed for 8 major OEMs, Capgemini Engineering offers its clients specialized automotive engineering expertise in the areas of e-Mobility and ADAS (Advanced Driving Assistance Systems).

Scope and assets

We help our customers to get ahead in the e-mobility race, offering a One-stop shop: from requirements to homologation, providing unrivaled expertise and safety compliant electrification design of Passenger Cars and Commercial & Special Vehicles. Its specific equipment around low and high frequency, climate, corrosion, homologation and Conformity of Production (COP) allow a complete project delivery from design to prototyping testing and homologation.

Benefits

Having experienced engineering professionals and state-of-the-art testing facilities under the same roof enable Capgemini Engineering to find the best solutions, which reduce customer's time, cost and warranty problems.

Expertise and Solutions

Vehicle mission profile analysis

Selecting the right Electrification System Strategy at the start of the development of an e-driveline, finding the perfect balance between power, range, load capacity, energy consumption and charging speed is key. We leverage our extensive electrification experience, embedded in our unique simulation tool.

Electric & Hybrid Architectures

With the right Electrification System Strategy defined, designing the System & Electric architectures for an accurate energy management system is the next crucial step in the electrification process. HW and SW interface definition, High & Low Voltage layout and Communication layout are some of our core competences in this field. Applying our 20 years' experience in automotive high voltage systems.

Concept & Design

Conceptualizing and designing the high voltage-, charging-, E-drive- and power electronics systems while also ensuring system integration compatibility is where our experience lies. Having delivered these services for 20 years on more than 30 electrification design projects to more than 8 major automotive OEMs.

Prototype build, Testing & Homologation

Completing the electrification R&D cycle, we build the virtual & physical vehicle prototype, perform testing to define & ensure the quality and reliability of the Electrification System design, including the homologation activities. Leveraging the extensive experience (+20y) in automotive electrification projects, with major OEMs.

Why Capgemini Engineering?

Deep Expertise	• A strong track record for e-commercial and e-passenger cars • Relevant customer references • R&D program to innovate and anticipate the market needs • Co-innovation program (with 2getthere) • Several technologies (BEV-HEV-PHEV)
International Network	• International Experts and Specialists with technical skills recognized, providing State-of-the-art technical solutions • Project Management skills approved and shared with the OEMs • Partners with skills recognized by the OEMs
One Stop Shop Approach	• Delivering a complete project from design to prototyping testing and homologation
Safety Compliant Expertise	• Defining the safety goals in an end-to-end solution from the functional safety requirements up to safety validation and verification plan • Compliance with standards like ISO-26262
Feasibility and In-house Software Tool	• The quality of the feasibility tool is built on accumulated experience in several in house projects, which we have executed over the past ten years
Supplier and Component Database	• Strong supply change management, with independency and global network

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About Capgemini Engineering

Capgemini Engineering combines, under one brand, a unique set of strengths from across the Capgemini Group: the world leading engineering and R&D services of Altran – acquired by Capgemini in 2020 – and Capgemini's digital manufacturing expertise. With broad industry knowledge and cutting-edge technologies in digital and software, Capgemini Engineering supports the convergence of the physical and digital worlds. Combined with the capabilities of the rest of the Group, it helps clients to accelerate their journey towards Intelligent Industry. Capgemini Engineering has more than 52,000 engineer and scientist team members in over 30 countries across sectors including aeronautics, automotive, railways, communications, energy, life sciences, semiconductors, software & internet, space & defence, and consumer products.

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